

4door_1



© ELECTROLUX ZANUSSI S.p.A.
Spares Operations Italy
Corso Lino Zanussi, 30
I - 33080 PORCIA / PN (ITALY)

Fax +39 0434 394096

Publication Number
599 35 28-08
020603
ITZ/SERVICE/AA

**4-Door
Refrigerator
with R600a**

Contents

1. Presentation	5
2. Components	7
3. Air circulation.....	8
4. Diagrams	9
4.1. Wiring diagrams	9
4.2. Circuit diagram	10
5. Description of components	11
5.1. Battery evaporator and fan	11
5.2. Defrosting heater	11
5.3. Water duct heater.....	11
5.4. Thermal cut-outs	12
5.5. Rubber valve	12
5.6. Electronic thermometer	12
5.7. Characteristics of the NTC sensor	13
5.8. Flap-operated thermostat.....	14
5.9. Control panel.....	15
6. Operation	16
6.1. Normal.....	16
6.2. Defrosting.....	17
7. Accessibility	18
7.1. Freezer compartment.....	18
7.2. Removing the control panel	19
7.3. Replacing the thermostats	19
7.4. Replacing the flap-operated thermostat.....	19
7.5. Timer	20
7.6. Defrosting heater	22

1. Presentation

The four-door refrigerator consists of three sections which are specially designed to conserve the various types of food in the best possible way.

Refrigerator compartment ("A"): air circulation by natural convection makes it possible to maintain the compartment at the ideal temperature and humidity for conservation of fresh foods.
The temperature is controlled by an adjustable thermostat positioned on the control panel.

Zero degrees compartment ("B"): the temperature in this compartment is maintained constant at between 0°C and +3°C. The compartment is cooled by the circulation of forced air from the freezer compartment below.
The temperature is controlled by a flap-operated thermostat which opens and closes the air duct between the refrigerator and the freezer.

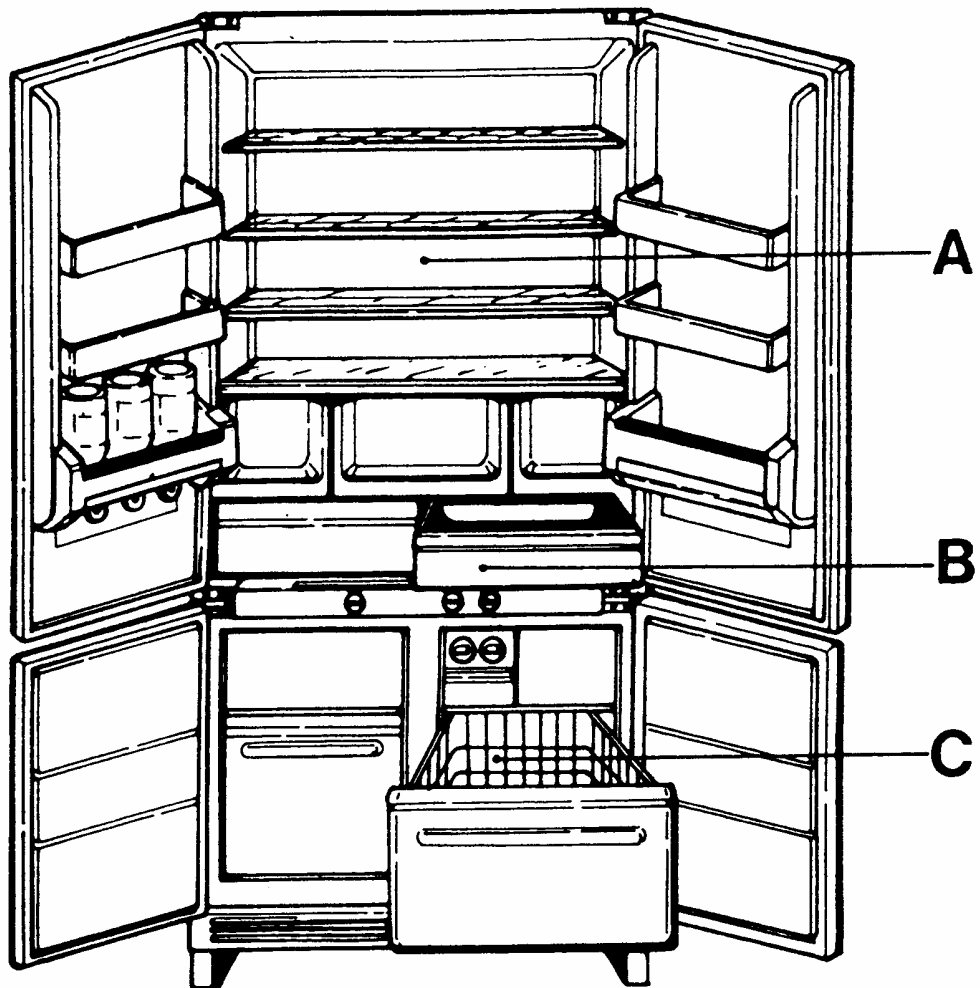
Freezer compartment ("C"): The cold is produced by a battery evaporator; forced circulation of the air is provided by a fan. In this way, the humid air inside the compartment is deposited in the form of ice on the battery, and not on the packets of food.

Periodically (at intervals of 12 hours), the timer switches on the defrosting heating element in order to melt any ice that has accumulated on the battery. The duration of the defrosting cycle is approximately 11 minutes.
When the temperature of the battery reaches +10°C, the end-of-defrosting thermal cut-out switches off the heating element. If this switch should malfunction, a second thermal cut-out intervenes as soon as the temperature reaches +40°C.

An electronic thermometer with a LED display shows the temperature inside the compartment.
The temperature is controlled by an adjustable thermostat positioned on the control panel.

The appliance is fitted with two separate cooling circuits:

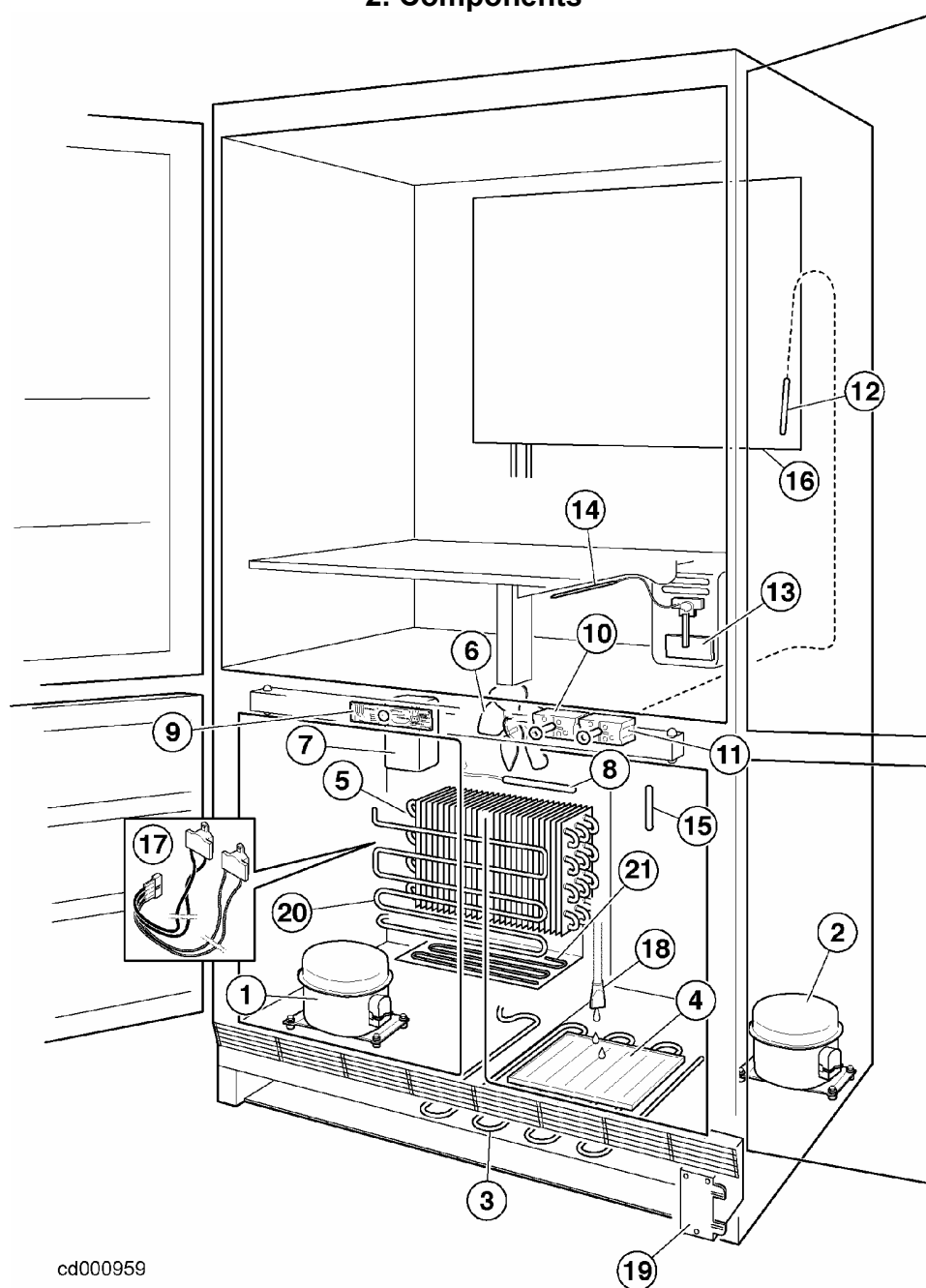
1. refrigerator circuit;
2. zero degrees - freezer compartment circuit.



4door_1

- A: refrigerator
- B: zero-degrees compartment
- C: freezer

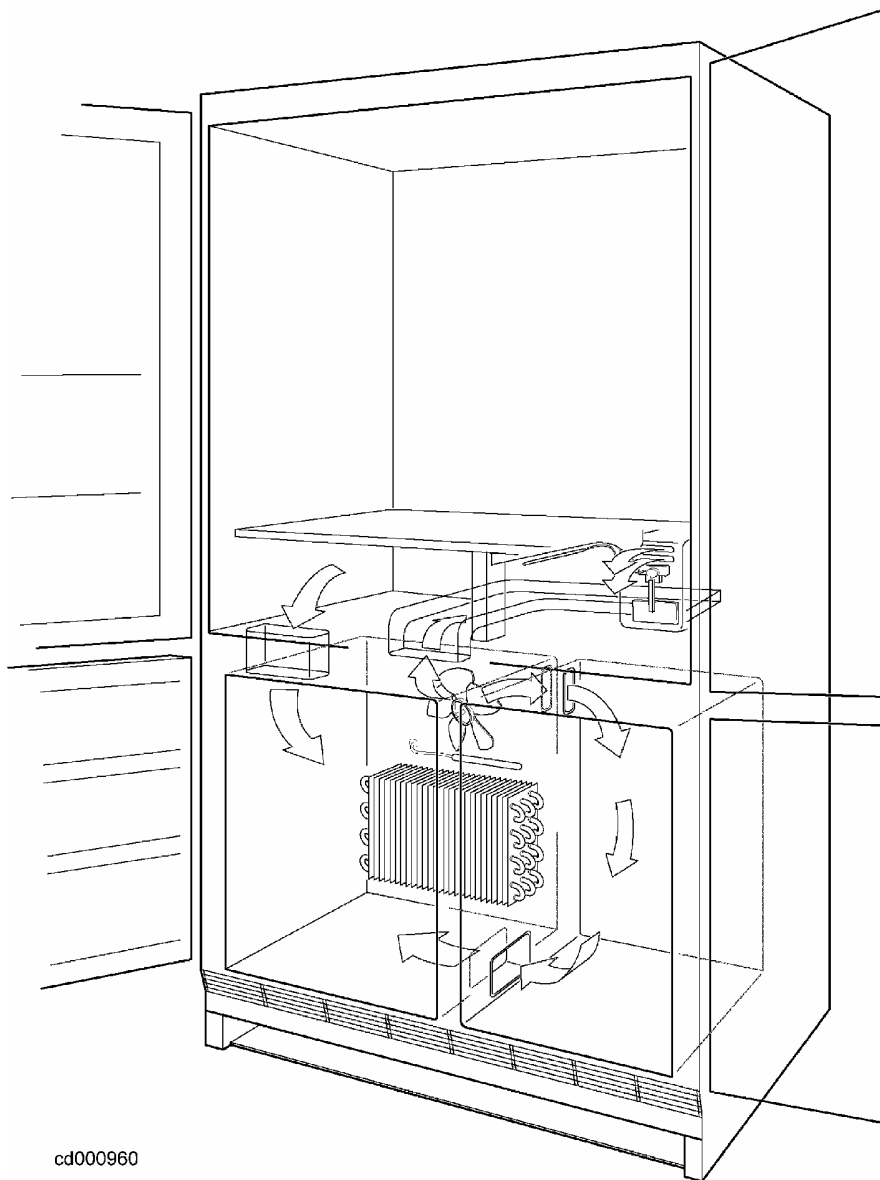
2. Components



cd000959

1. freezer compressor - 2. refrigerator compressor - 3. refrigerator condenser - 4. water tray
 5. battery evaporator - 6. evaporator fan, 7. terminal block, 8. freezer thermostat bulb, 9. electronic thermometer with LED display, 10. freezer thermostat, 11. refrigerator thermostat, 12. refrigerator thermostat bulb, 13. flap-operated thermostat, 14. flap thermostat bulb, 15. NTC sensor for electronic thermometer, 16. encased refrigerator evaporator, 17. thermal cut-outs, 18. rubber valve, 19. timer, 20. defrosting heater, 21. water duct heater

3. Air circulation



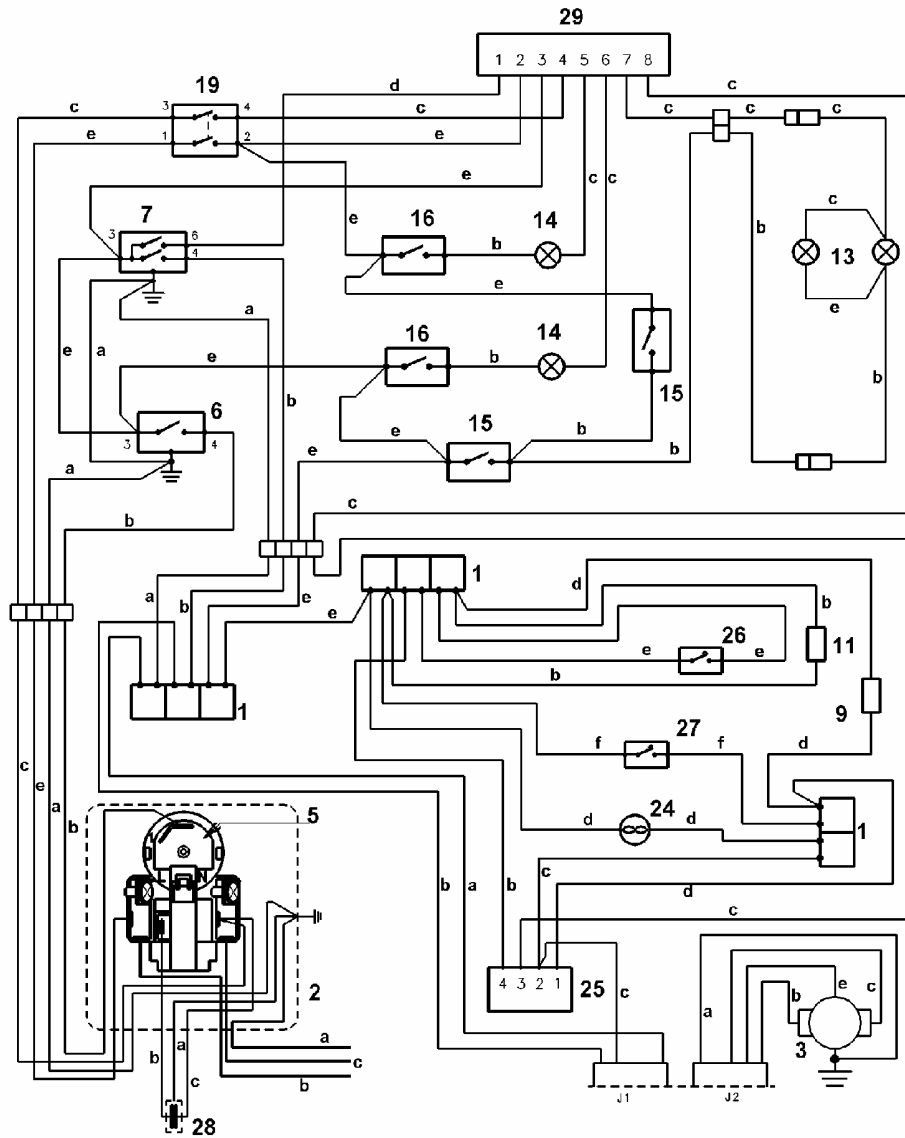
Freezer compartment: the cold produced by the battery evaporator is circulated by a fan positioned above the evaporator. The air enters the right-hand compartment and flows back into the left-hand compartment through special apertures. The temperature is controlled by the bulb of the open-air thermostat positioned immediately above the battery.

Zero-degrees compartment: the air enters through a duct (embedded in polystyrene) positioned above the fan, and exits through the apertures in the flap-operated thermostat. An aperture in the lower left-hand section of the zero-degrees compartment allows the air to flow back into the freezer compartment. The temperature is controlled by the flap-operated thermostat.

Refrigerator compartment: The air circulates by natural convection. The temperature is controlled by the bulb of the hidden thermostat.

4. Diagrams

4.1. Wiring diagrams (see the specific diagram of the model !)

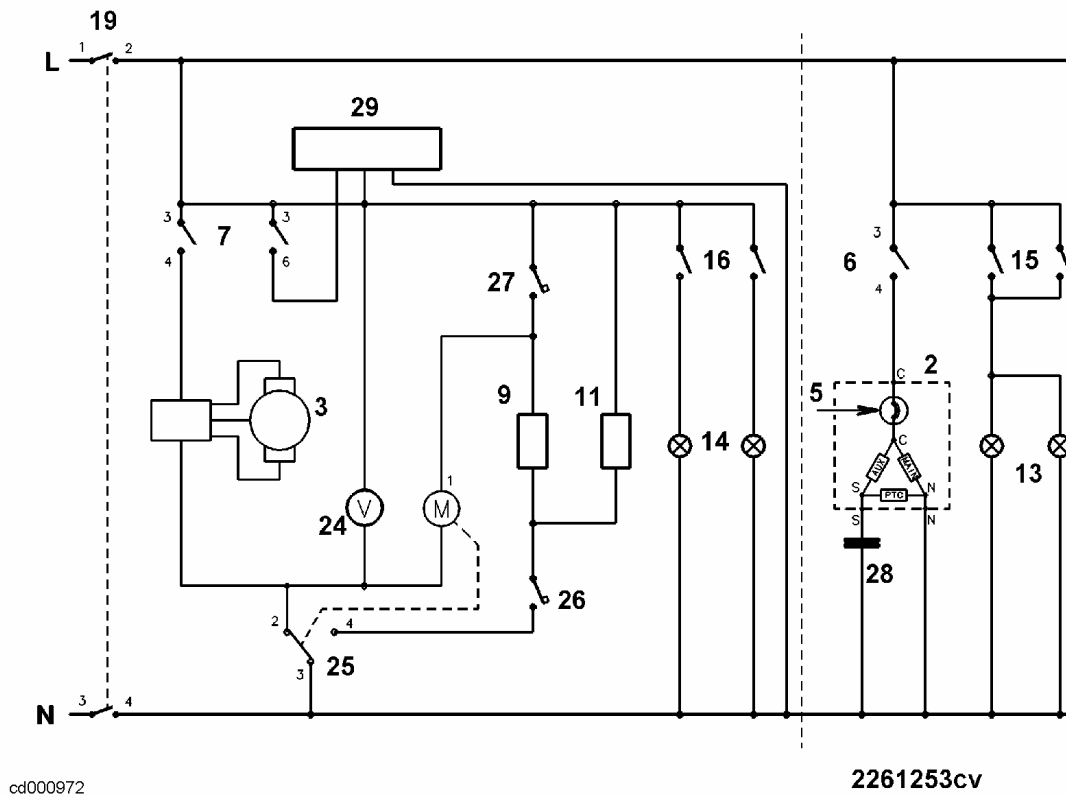


cd000670

1. terminal block, 2. refrigerator compressor, 3. freezer compressor, 5. motor protector, 6. refrigerator thermostat, 7. freezer thermostat, 9. defrosting heater, 11. water duct heater, 13. refrigerator light, 14. freezer light, 15. refrigerator door switch, 16. freezer door switch, 19. ON/OFF switch, 24. fan, 25. timer, 26. safety thermal switch, 27. defrosting thermal switch (+10°C), 28. service condenser, 29. electronic thermometer.

a) yellow/green - b) brown - c) blue - d) white - e) black - f) grey - g) red - h) orange

4.2. Circuit diagram (see the specific diagram of the model !)



1. terminal block, 2. refrigerator compressor, 3. freezer compressor, 5. motor protector, 6. refrigerator thermostat, 7. freezer thermostat, 9. defrosting heater, 11. water duct heater, 13. refrigerator light, 14. freezer light, 15. refrigerator door switch, 16. freezer door switch, 19. ON/OFF switch, 24. fan, 25. timer, 26. safety thermal switch, 27. defrosting thermal switch (+10°C), 28. service condenser, 29. electronic thermometer.

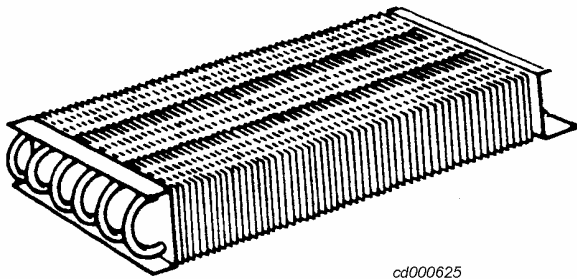
a) yellow/green - b) brown - c) blue - d) white - e) black - f) grey - g) red - h) orange

5. Description of components

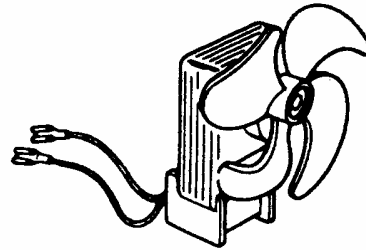
5.1. Battery evaporator and fan

The battery-type evaporator, though compact, is designed to provide a high degree of cooling power. This has been achieved by increasing the surface of the battery, in which a large number of aluminium fins are fitted to a copper coil.

All the humidity in the compartment accumulates on the battery, which is in the lowermost part of the freezer, thanks to the forced-air circulation generated by the fan (3.1W power, 2400 rpm) positioned above the evaporator.



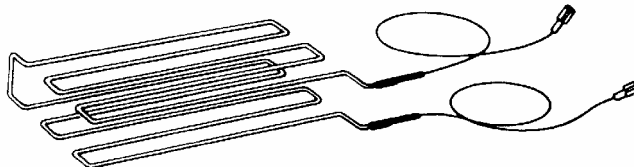
cd000625



cd000626

5.2. Defrosting heater

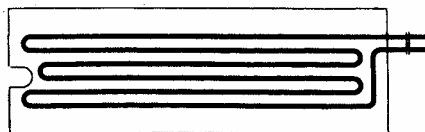
At intervals, it is necessary to defrost the ice that has accumulated on the evaporator. To do this, a timer positioned on the bottom of the cell (on the right) intervenes every 12 hours (under the lower hinge of the right freezer door), switching on a 190W heating element (303 Ohm resistance; 240 Volt voltage) positioned in direct contact with the battery.



cd000627

5.3. Water duct heater

A heating element 21.5 W (2679 Ohm resistance; 240 Volt voltage) is fitted beneath the water drainage duct in order to prevent freezing of the defrost water. This heating element is connected in parallel to the defrosting heater.

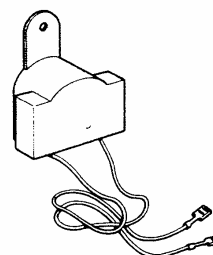


cd000640

5.4. Thermal cut-outs

Two thermal cut-outs are positioned in direct contact with the Battery which switch off the defrosting heater at:

- +10°C end-of-defrosting switch (cable colour: grey);
- +40°C safety switch (cable colour: black).



5.5. Rubber valve

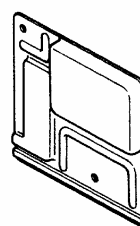
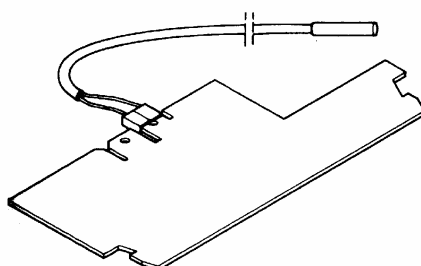
The water produced by the defrosting cycle is expelled from the appliance through a special silicone rubber valve fitted to the duct drain. The structure of this valve is such that the defrost water drains off without obstruction while, during the cooling phase, the slight vacuum inside the freezer compartment causes the valve to close, thus preventing humid air from being drawn in from outside the appliance.



cd000629

5.6. Electronic thermometer

A PCB positioned behind the control panel pilots a 6-LED display panel. The LEDs light sequentially to display the temperature inside the freezer compartment. The same PCB also pilots the ON/OFF LED, the "SUPER" LED and an "ALARM" LED, which lights when the temperature rises above -9°C.



cd000630

The PCB is piloted by an NTC sensor whose resistance varies with the temperature. This sensor is positioned on the bottom of the compartment in contact with a eutectic mass which guarantees a constant value displayed by the LEDs thus avoiding spurious values in case of momentary temperature variations.

5.7. Characteristics of the NTC sensor

Conversion table:

° C	Δ	OHM
10	±0.6	5348
9	±0.6	5611
8	±0.6	5888
7	±0.6	6182
6	±0.6	6491
5	±0.4	6818
4	±0.4	7164
3	±0.4	7529
2	±0.4	7916
1	±0.4	8325
0	±0.4	8758
-1	±0.4	9216
-2	±0.4	9701
-3	±0.4	10215
-4	±0.4	10759
-5	±0.4	11337
-6	±0.6	11949
-7	±0.6	12598
-8	±0.6	13288
-9	±0.6	14019
-10	±0.6	14795
-11	±0.7	15620
-12	±0.7	16497
-13	±0.7	17429
-14	±0.7	18420
-15	±0.7	19475
-16	±0.8	20596
-17	±0.8	21791
-18	±0.8	23063
-19	±0.8	24418
-20	±0.8	25862
-21	±0.9	27402
-22	±0.9	29045
-23	±0.9	30797
-24	±0.9	32668
-25	±0.9	34666
-26	±1	36800
-27	±1	39082
-28	±1	41521
-29	±1	44131
-30	±1	46921
-31	±1	49910
-32	±1	53111
-33	±1	56541
-34	±1	60218
-35	±1	64161
-36	±1	68393
-37	±1	72932
-38	±1	77808
-39	±1	83046
-40	±1	88577

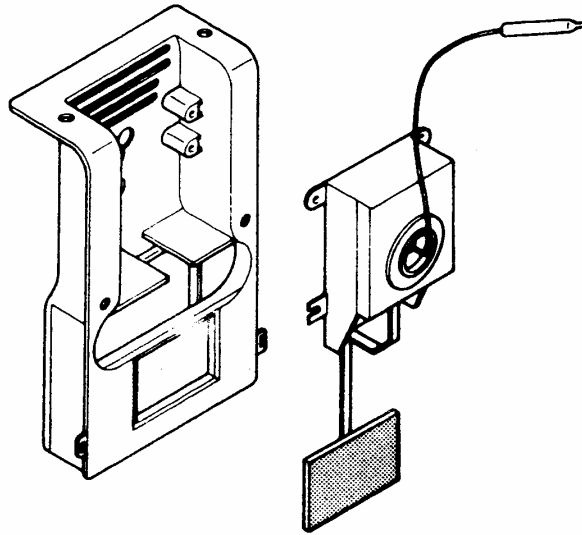
cd000973

5.8. Flap-operated thermostat

The flap-operated thermostat is positioned at the bottom of the zero-degrees compartment. This thermostat is sealed internally by a transparent cover.

The thermostat opens and closes the duct through which air enters from the compartment below.

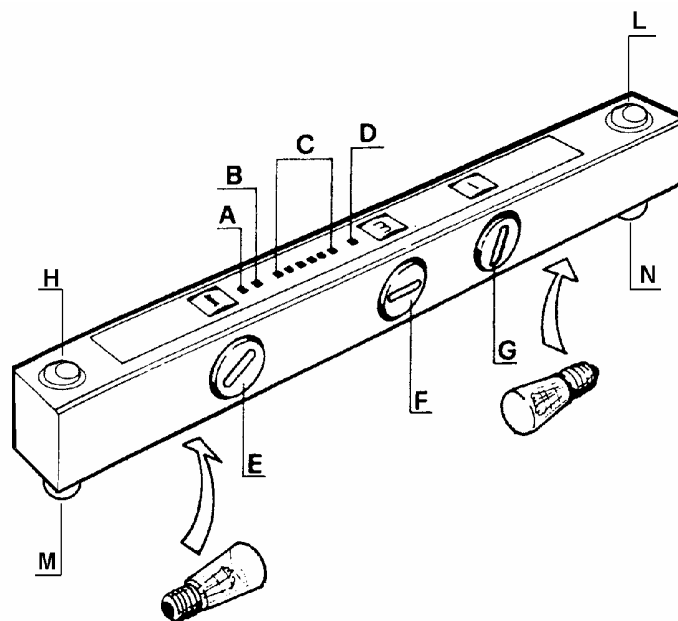
The temperature in this compartment is maintained constant by the freezer compartment fan, which is always in operation (except during defrosting).



cd000631

Minimum position	Maximum position
+2.5 °C	-3.5 °C

5.9. Control panel



cd000961

- A = "ON" LED;
- B = "ALARM" LED;
- C = electronic thermometer;
- D = rapid freezing LED;
- E = main switch;
- F = freezer thermostat and rapid freezing knob;
- G = refrigerator thermostat knob;
- H = upper left light button;
- L = upper right light button;
- M = lower left light button;
- N = upper right light button.

6.2. Defrosting

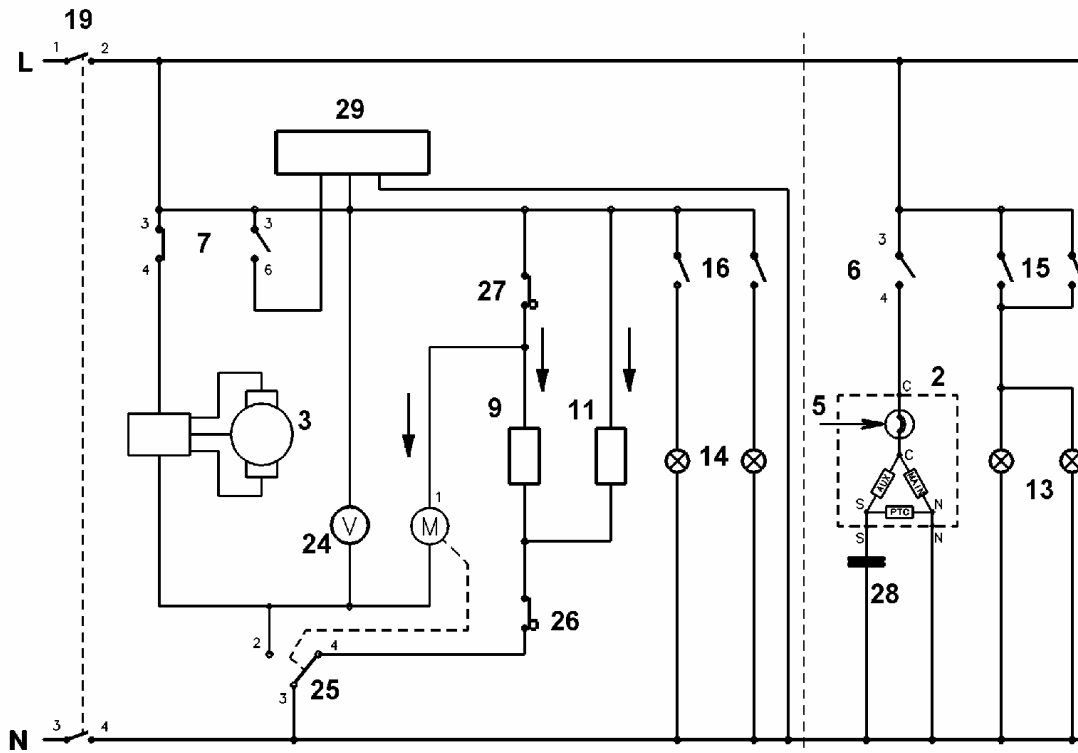
The evaporator is the coldest part of the compartment, and it is here that all the humidity inside the compartment tends to accumulate. As a result, it is necessary to defrost the battery at periodic intervals of about 12 hours, therefore, the timer switches from contact **3-2** to contact **3-4**, switching off the compressor and the fan and switching the defrosting heating element (**9**) on and at the same time also the heating element beneath the water drain duct. (**11**).

The heat produced by the heating element does not increase the temperature inside the freezer compartment, because it is entirely absorbed during the defrosting process of the ice on the evaporator.

When the battery reaches +10°C, the end-of-defrosting thermal switch (**27**) switches off the defrosting heater, but leaves the water duct heater on. If for any reason, it does not switch on and the battery temperature rises up to +40 °C, the heating elements will be switched off by the safety thermal switch (**26**).

After about 11 minute defrosting, the timer switches to contact **3-2** again switching the compressor and the fan on and switching the heating elements off.

The arrows in the picture indicate the current path.



cd000975

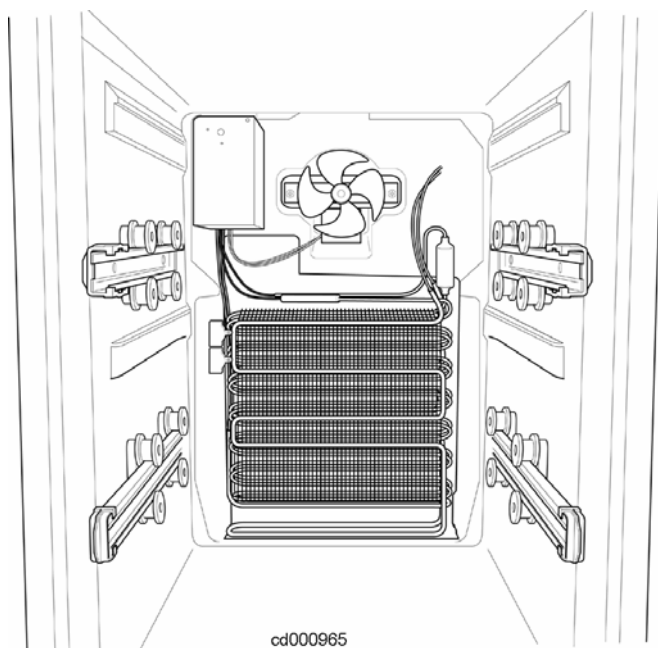
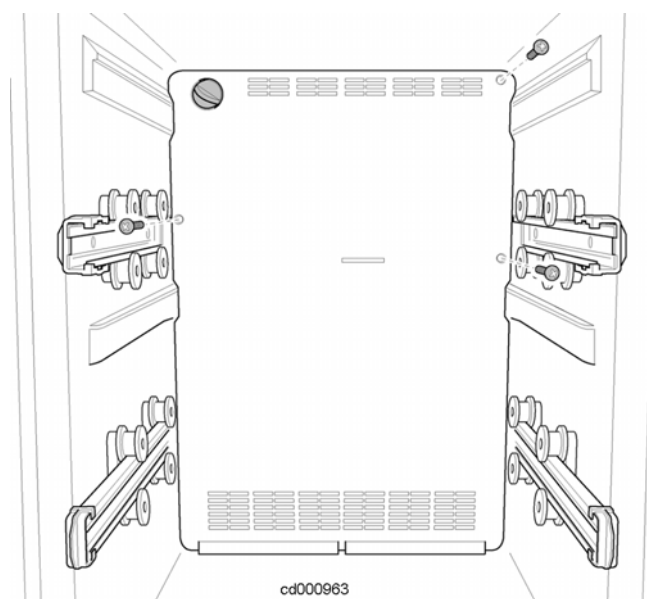
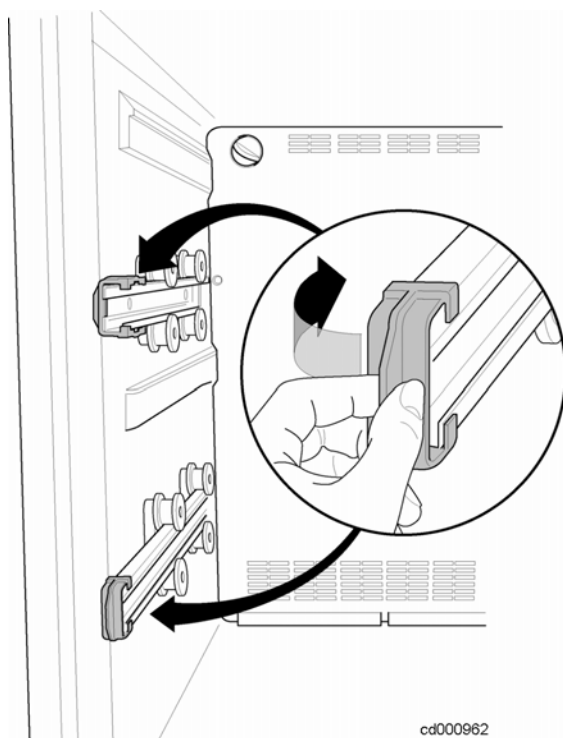
2261253cv

7. Accessibility

7.1. Freezer compartment

Proceed as follows to access the components of the freezer compartment:

- remove the gaskets from the guides turning the holders as shown in picture;
- remove the 3 screws of the screen and slide out laterally.

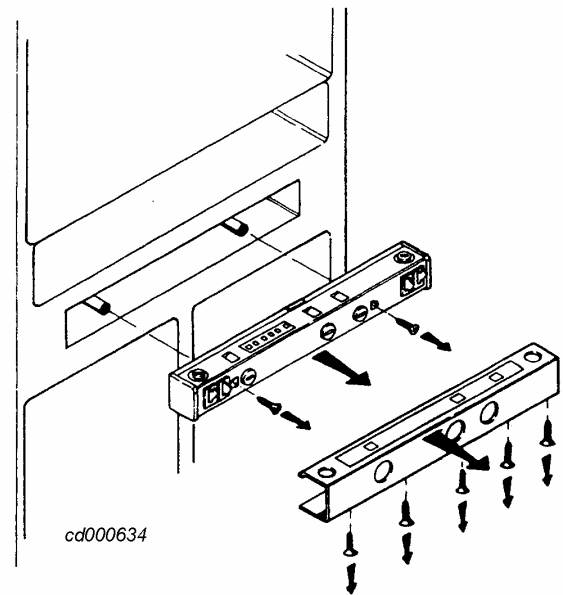


7.2. Removing the control panel

In order to access the components fitted to the control panel, proceed as follows:

- press the light switches (in the upper and lower sections of the control panel), and rotate 45°;
- remove the 5 screws which secure the control panel mask in position;
- remove the mask starting from the lower edge; remove the two screws which secure the control panel to the cabinet and remove the control panel by rotating downwards.

When re-assembling, it is important to ensure that the sealing gasket is correctly positioned between the control panel and the mask.



7.3. Replacing the thermostats

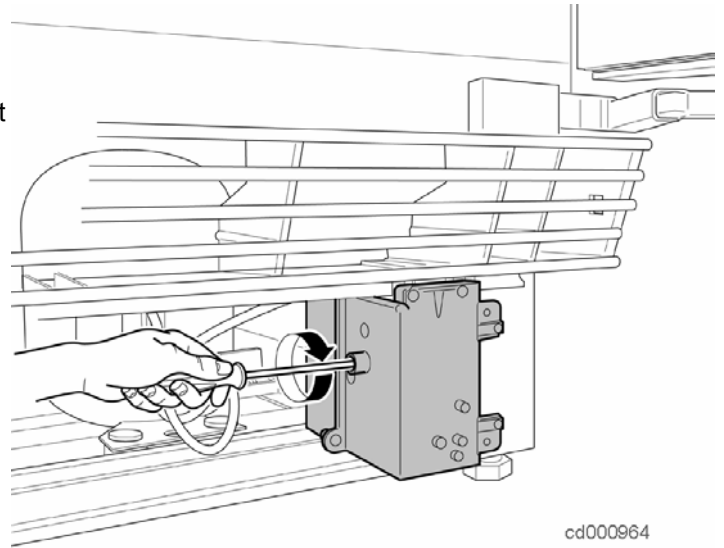
The refrigerator thermostat is encased. Simply pull the thermostat from the tube containing the capillary. To remove the freezer thermostat, it is necessary to access the evaporator battery and straighten the capillary in order to pull it out.

7.4. Replacing the flap-operated thermostat

It is necessary to detach the thermostat bulb and loosen the two screws which secure the thermostat to the compartment wall.

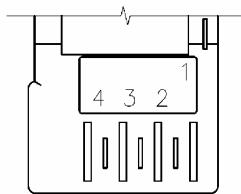
7.5. Timer

The timer is inside the box positioned at the bottom (on the right) of the appliance (beneath the lower hinge of the right freezer door). By using a screwdriver it is possible to rotate the cam shaft manually, only clockwise, to switch the contacts switch 3-4 and 3-2.



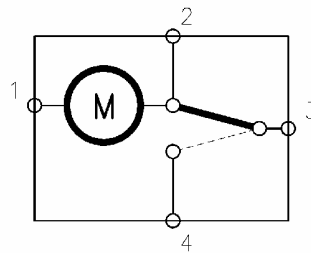
cd000964

VIEW OF THE TIMER CONTACTS



cd000966

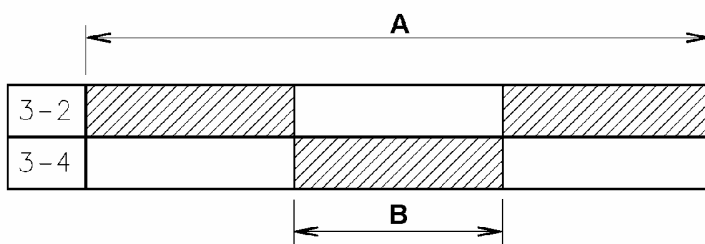
ELECTRIC CIRCUIT OF THE TIMER





Contact 2 : compressor;
Contact 4 : heating
elements.

cd000967

TIMER CYCLE



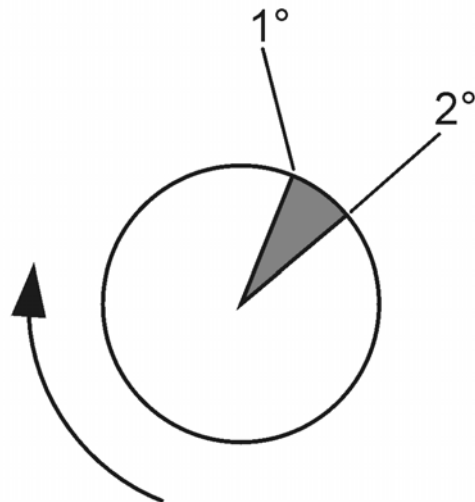
 CLOSED CONTACT
 OPEN CONTACT

cd000969

cd000968

A TIME (total cycle)	B TIME (defrosting)
12h 2'	11'

By rotating the timer shaft clockwise, with the help of a screwdriver, two clicks that indicate the closure of the contacts are heard. As it is shown in the picture (the position of the clicks is merely indicative), between the 1st click and the 2nd click the run is shorter, between the 2nd click and the 1st click the run is longer:



cd000971

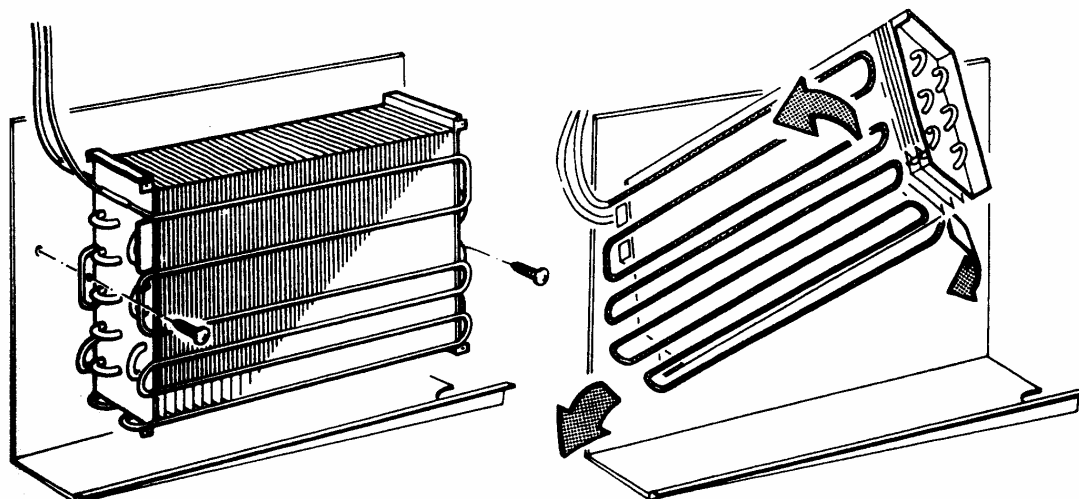


Warning:

- In order to test the appliance during “normal” operation, it is necessary to rotate the timer cam till the 2nd click so as to close contact 3-2;
- In order to test the appliance during “defrosting” operation, it is necessary to rotate the timer cam till the 1st click so as to close contact 3-4.

7.6. Defrosting heater

Remove the screws which secure the battery evaporator to the bottom of the compartment. Very carefully, incline the battery as shown, taking care not to damage the tubes. The heating element is inserted by pressure into the apertures in the fins of the battery.



cd000637